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Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554

In the Matter of	)	
Advanced Television Systems	)	
and Their Impact Upon the	)	MM Docket No. 87-268
Existing Television Broadcast	)	
Service	)	

COMMENTS OF
THE NATIONAL CABLE TELEVISION ASSOCIATION, INC.

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TABLE OF CONTENTS

SUMMARY

In the Notice, the Commission proposes a comprehensive plan for supplanting the current NTSC television transmission standard with a vastly improved high definition television ("HDTV") system. Under the plan, the Commission intends to allocate additional spectrum to enable broadcasters to simulcast an NTSC-incompatible HDTV channel while continuing to transmit the conventional NTSC channel. This approach would allow broadcasters to make the transition to HDTV in the most efficient and least disruptive manner.

From the cable industry's perspective, however, the simulcast regime may pose significant complications and burdens for cable carriage of broadcast channels. Indeed, the introduction of dual NTSC/HDTV broadcast programming may place enormous stress on cable channel capacity in some markets. While normal upgrades and rebuilds of cable plant, combined with the use of fiber and digital compression, may substantially alleviate this problem, these developments are not likely to be fully in place in the early stages of HDTV implementation.

Thus, like broadcasters, cable operators will need the flexibility to structure their delivery of HDTV -- both broadcast and cable-originated -- in a manner that ensures the successful transition to the new environment for cable subscribers. The Commission should not, therefore, impose any mandatory carriage

requirements on the cable industry during any phase of the transition.

In addition, the HDTV system will need certain attributes in order for the cable industry effectively to implement the new technology and maximize its potential in the marketplace. Specifically, the Commission should adopt standards that ensure encryption capability, addressability, inter-operability and extensibility. Finally, the selection of an HDTV standard must allow a sufficient timetable for rigorous field testing and evaluation of the proponent systems over both the terrestrial broadcast and cable distribution network.

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In the Matter of Advanced Television Systems and Their Impact Upon the Existing Television Broadcast Service	)))))	MM Docket No. 87-268

COMMENTS OF
THE NATIONAL CABLE TELEVISION ASSOCIATION, INC.

The National Cable Television Association, Inc. ("NCTA") hereby submits its comments in the Notice of Proposed Rulemaking ("Notice") in the above-captioned proceeding. NCTA is the principal trade association of the cable television industry in the United States, representing the owners and operators of cable systems serving over 90 percent of the nation's 55 million cable households. Its members also include cable programmers, cable equipment manufacturers and others affiliated with the cable television industry.

INTRODUCTION

In the Notice, the Commission takes a significant step toward refining a regulatory approach and developing a plan for the implementation of terrestrial broadcast advanced television ("ATV") service. This action builds on the Commission's decision last year to adopt a "simulcast" high definition television ("HDTV") system under which broadcasters would continue to transmit an NTSC signal on one 6 MHz channel while simultaneously

transmitting an HDTV signal on a separate, newly-allocated 6 MHz channel.[1/] The new channel would employ design principles independent of the existing NTSC technology, thereby enabling the development of systems offering significantly greater improvement in television picture and sound quality than NTSC-based systems. The simulcast approach would also protect consumers' existing investment in television equipment by ensuring that NTSC programming is available until HDTV succeeds in the marketplace. And with the eventual surrender of the NTSC signal spectrum, simulcasting would promote spectrum efficiency by ultimately minimizing the amount of spectrum needed for HDTV.

The Commission's decision gave ATV proponents clear direction and a clean slate to focus their efforts on designing an entirely new digitally-based television transmission scheme. Five of the six proponent systems that are being tested by the Advanced Television Test Center and Cable Labs utilize digital formats that are incompatible with NTSC.[2/] The cable industry, through Cable Labs, has actively supported and participated in the testing and evaluation of these simulcast systems with a view toward the successful implementation of an ATV system for both broadcast and cable television.

1/ First Report and Order, MM Docket No. 87-268, 5 FCC Rcd. 5627, September 21, 1990.

2/ The NBC-Sarnoff ACTV system is an analog system that is compatible with NTSC transmission.

From the early stages of the standards-setting process, the cable industry's primary concern has been that, with 60 percent of the American households receiving their broadcast signals via cable, the broadcast HDTV standard should be capable of being effectively retransmitted over cable. Indeed, public acceptance and appreciation of the benefits of HDTV will not be achieved unless cable can deliver a high quality broadcast signal. Therefore, the selection of an HDTV standard must include a sufficient timetable for rigorous field testing and evaluation of the proponent systems in both the over-the-air and cable environment.

Successful implementation of HDTV by the cable industry will also depend on several other system attributes: encryption capability, addressability, inter-operability and extensibility. Finally, the affected industries will need flexibility to effectively implement the transition from NTSC to HDTV and to solidify HDTV in the consumer marketplace.

DISCUSSION

The Commission envisions ATV as a major technological improvement in television transmission that will at some point entirely replace the existing NTSC standard. As the Notice evidences, however, there are many complex issues yet to be resolved in achieving a smooth and orderly transition from NTSC to HDTV. Once the difficult spectrum eligibility and spectrum allocation issues are resolved, conversion to HDTV will be a complicated and costly process for broadcasters, and cable

operators as well.[3/] Nevertheless, the simulcast concept offers broadcast stations, unlike cable systems, a means to effect a transition to HDTV without causing serious dislocations or impediments to continuing off-air service. As NCTA has stated previously, however, the simulcast approach will have distinct ramifications for cable carriage of broadcast signals.

A. The Cable Industry Will Need the Flexibility to Structure Its Delivery of ATV Without Any Mandatory Carriage Requirements

Cable's evolution has witnessed periodic instances where the growing abundance of diverse programming choices significantly out paces local system channel capacities. As with the development of cable satellite programming networks, the advent of simulcast HDTV/NTSC programming will place enormous stress on current capacity in some markets. And although this may be a somewhat short-term phenomena, it will nevertheless pose very real and significant carriage issues for cable operators and their subscribers. Operators hoping to accommodate the new video format as it becomes available in the marketplace may well encounter practical obstacles.

3/ At a minimum, cable operators will need to install new headend equipment for signal processing, transcoding, ghost cancelling, modulation, commercial insertion, and studio production. The new format may also require the replacement of home converters or descramblers. Some systems may need significant expansion of bandwidth capacity in order to carry the increased number of simulcast signals.

At the outset, cable operators could be faced with the prospect of having to double the amount of capacity that is devoted to broadcast retransmissions in order to deliver the same amount of broadcast programming now being provided to subscribers. Moreover, in addition to the potential issues and concerns attendant to carrying dual broadcast channels, the already large and growing number of national and regional satellite-delivered cable networks and pay-per-view services -- many of which themselves will be converting to an HDTV format -- will be vying for carriage on local cable systems. While normal upgrades in plant capacity combined with increased use of fiber and the introduction of digital compression may provide sufficient capacity to reduce, if not fully accommodate such needs in the future, these developments will not happen overnight. And they are unlikely to be fully in place in the early days of the transition to HDTV.

By its First Report and Order in this proceeding, the Commission opted for a simulcast HDTV system because it would allow the broadcast industry to introduce the new video format in the most non-disruptive and efficient manner. The Commission also recognizes that "any approach we adopt should give broadcasters the flexibility necessary to ensure that the new ATV technology succeeds in the marketplace."[4/] Similarly, the cable industry will need the flexibility to structure its delivery of

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4/ Notice at para. 45.

ATV service in a manner that ensures the successful transition to the new environment for its subscribers.

Thus, while cable operators may indeed carry all of the new programming in the HDTV format, they must be able to be responsive to consumer desires and reaction to the new service in fulfilling capacity demands. In accomplishing this goal, they should not be subject to any mandatory carriage requirements or other obligations during any phase of the process. Such requirements would not only burden cable operators, but could adversely impact both cable programmers -- who could lose carriage altogether -- and cable subscribers -- who would risk losing diverse programming choices.[5/]

Moreover, as we move to this new technology, there is a practical means of alleviating the burden of carrying duplicative simulcast programming. Since any viewers wishing to receive HDTV programming would have to purchase new HDTV receivers, over-the-air reception could be made especially easy if electronic switching or input selector devices were required to be built into all such receivers. And, even if cable does not carry all of the local NTSC/HDTV simulcast channels, local cable viewers could still receive such signals over-the-air.

5/ Although "must carry" is not addressed directly in the Notice, the issue has been raised in informal discussions on the implementation of HDTV. NCTA believes it is important to clarify this issue early in the Commission's consideration of various ATV implementation scenarios.

Throughout this proceeding, the cable television industry has worked closely with the FCC's Advisory Committee on Advanced Television Service, the inter-industry Advanced Television Systems Committee, the ATTC and others to make HDTV a reality. As the technology reaches the implementation phase, NCTA will continue to work toward the most efficient, non-disruptive transition for cable subscribers.

B. Compatibility and Extensibility

To date, the ATV standards-setting process has been marked by consensus-building among the various industries that will be affected by the new standard. Indeed, even before the Commission formally initiated this proceeding, the shared interests of the broadcast, cable, satellite and consumer electronics industries spurred cooperative efforts to develop voluntary compatibility standards for HDTV.[6/]

In the Commission's initial Notice of Inquiry and Tentative Decision and Further Notice of Inquiry in this proceeding, the interested industries universally supported the development of a cost-effective HDTV interconnection capability among video delivery media. They fully recognized that the development of incompatible standards would only slow down the transition to ATV

6/ In addition to the FCC Advisory Committee on Advanced Television Service, the Advanced Television Systems Committee ("ATSC") is an important inter-industry organization actively engaged in designing interface devices for the next generation of television receivers.

service and result in public confusion and market instability. The incentive and commitment to attain inter-operability among alternative video distribution media has not waned since that time.

The industries are still working together, through ATSC, the Electronics Industries' Association and the ATV Advisory Committee, to devise techniques for accommodating different transmission formats in the high definition receiver. The external "multi-port" interface connector, which early on gained favor as an efficient, consumer-friendly approach to inter-operability, is being studied and redesigned in light of the digital transmission schemes developed over the past year.[7/] Alternatively, an interconnection capability that at some point could be built into the HDTV receiver may be a feasible approach. While it is still too early to decide which mechanism will be the most appropriate in implementing HDTV, the Commission should encourage the on-going development of compatibility and inter-operability standards without government intervention.

Extensibility, which refers to the ATV standard's ability to adapt to innovation,[8/] is another important element of the HDTV

7/ As the Commission has previously noted, the effectiveness of the multi-port concept requires that some minimum signal standards be agreed upon by all delivery media, including the number of scan lines, the field rate and the aspect ratio.

8/ See Notice at para. 47, citing Comments of the Committee for Open High Resolution Systems, May 7, 1991.

standard. If the ATV process has taught us anything, it is that the technology is not static -- it is rapidly changing and constantly improving. In light of this, the standard adopted for the next generation of television receivers should include hooks for augmenting and improving the technology.[9/] Therefore, the Commission and the ATV Advisory Committee are urged to require proponents to design systems that are extensible in the future.

C. Encryption Capability

In addition to providing the ability to improve the HDTV system in the future, the ATV proponents should incorporate encryption capability now. As NCTA has pointed out in the past, securing cable programming services from unauthorized reception will be crucial to implementing HDTV for cable subscribers. Indeed, controlling access to HDTV programming is not only going to be important for cable programming, but for the retransmission of broadcast programming as well, since many cable systems scramble or encode all signals to secure their transmission.

The cable industry is concerned that the ATV proponents, in their quest to fit the video and audio information into 6 MHz, are neglecting to provide bandwidth for carrying addressing codes and commands to authorize or deauthorize reception. There is

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9/ For example, to date, the proponents have emphasized the design of ATV systems that fit within the standard 6 MHz television channel for broadcast transmission. While this channelization scheme currently works for other video delivery media, such media may have the capability to utilize additional bandwidth to augment the 6 MHz signal in order to provide an even higher quality signal.

also the possibility that some systems will be more susceptible than others to degradation when scrambling and descrambling techniques are introduced. In light of these factors, NCTA urges the Commission and the ATV Advisory Committee to include encryption capability for cable transmission among the attributes of the HDTV standard.[10/]

D. Testing

As noted earlier, the primary benchmark in the adoption of an HDTV standard is the completion of extensive laboratory and field testing of the candidate systems in both the over-the-air broadcast and cable environment. Indeed, the transmission capabilities and performance claims of the various proponent systems must be verified end-to-end in a real world setting.[11/]

ATTC and Cable Labs are conducting joint laboratory tests of the six proponent ATV systems. Last year, Cable Labs and the Public Broadcasting Service ("PBS") reached an initial agreement to conduct joint field demonstrations of ATV systems in several U.S. cities. The demonstrations will use end-to-end systems

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10/ NCTA is encouraged that ATSC is planning to test encryption techniques for satellite delivery of HDTV. This should yield some useful information for cable. However, separate tests for cable transmission are still necessary before a standard is adopted.

11/ As NCTA noted in earlier comments, the cable transmission plant subjects signals to varying degrees of noise, echoes, ghosts, micro-reflections and other artifacts. It will be important to ensure that the HDTV signal is robust enough to survive these distortions without significant degradation.

consisting of satellite, microwave, terrestrial broadcast and cable television distribution. The data will be supplied to the FCC ATV Advisory Committee in its deliberation of the various ATV proposals.[12/]

Even before the field tests get underway, however, ATTC and Cable Labs must complete an aggressive laboratory test schedule in 1992. Moreover, with the development of the first all-digital HDTV systems, the original test plan adopted by ATTC and Cable Labs has been supplemented by additional digital-specific tests. These tests are expected to lengthen the schedule by three or four days per system. In addition, ATTC and Cable Labs may need to conduct some retesting of the systems as part of their evaluation.

Given the likelihood that additional time will be devoted to laboratory testing and evaluation of the characteristics of digital systems, the Advisory Committee may need to adjust the timetable for the selection of a standard and for making recommendations to the Commission. Indeed, the Commission should not make any final decisions on the adoption of an ATV standard until the testing process -- including rigorous field testing over the broadcast and cable distribution network -- is completed.

12/ Cable Labs has committed to spending more than $4.1 million on the Advisory Committee testing process, including $2.5 million it has agreed to spend with ATTC.

CONCLUSION

For the foregoing reasons, the Commission should promote a flexible approach to the implementation of HDTV by the broadcast and cable industries. It should also adopt an HDTV system that is suitable for both broadcast and cable transmission, and that contains such criteria as inter-operability, extensibility, and encryption capability.

Respectfully submitted,

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